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EXAMINER	
MILLER, ROSE MARY	

ART UNIT	PAPER NUMBER
2856	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,290	BLAKLEY, DANIEL R.	
	Examiner	Art Unit	
	Rose M. Miller	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-14,16-28 and 30-56* is/are pending in the application.

4a) Of the above claim(s) *5-7,11,16,19-22,32,39 and 49-51* is/are withdrawn from consideration.

5)☒ Claim(s) *53-55* is/are allowed.

6)☒ Claim(s) *1-4,8,10,12,14,17,18,23-26,28,30,33-36,39-48 and 56* is/are rejected.

7)☒ Claim(s) *13,27,31,37,38 and 52* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 49-51 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Applicant's elected species, species 8, Figure 9, does not include these features. Therefore, these features do not and cannot read on the elected invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 49-51 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

2. Claims 1-4, 8, 10, 12-14, 17-18, 23-28, 30-31, 33, and 52 are objected to because of the following informalities: The phrase "at least one transducer in the transducer array is configured to attach to a sample material" is inconsistent with the originally filed specification. The originally filed specification disclosed the "sample material attached to or near the piezoelectric crystal" (see paragraph [0030]) or the sample being bonded to a transducer. This gives the connotation that the sample is smaller than the piezoelectric crystal (or transducer). The phrase above which was added in the last filed amendment gives the connotation that the sample is larger than the transducer or the transducer array – therefore requiring the transducer to be attached to the sample, not the sample to be attached to, or bonded to, the transducer as disclosed in the specification. A suggestion for correction is to reverse the phrase, allowing the sample to be attached or bonded to the transducer. This would be more consistent with Applicant's specification. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 56 is rejected under 35 U.S.C. 102(2) as being anticipated by **Harrison, Jr. et al. (US 5,119,342)**.

Harrison, Jr. et al. discloses a transducer-based sensor system (see Figures) comprising: a transducer array (10) including a plurality of transducers (see Figure 1) and a selector (element selecting multiplex network 12) coupled with the transducer array (10) and configured to selectively activate within the transducer array by applying an enabling signal (see column 3 lines 29-63) to the transducer array for at least one, but less than all, of the transducers, such that the transducer array includes at least one selected transducer and at least one unselected transducer, where: for a selected transducer, application of the enabling signal enables a transmission path (see Figure 2) between the selected transducer and the output processing subsystem, thereby permitting output signals to be transmitted from the selected transducer to the output processing subsystem; and the transducer array being configured to isolate any unselected transducers (see Figures 2 and 4) from the output processing subsystem, where such isolation is obtained by disabling the transmission paths, thereby substantially preventing output signals from being transmitted from the unselected transducers to the output processing subsystem (see column 3 lines 29–62 and column 4 line 61 – column 5 line 35). **Harrison, Jr. et al.** also discloses for each transducer, the transmission path between such transducer and the output processing subsystem (see Figure 1) is selectively enabled and disabled via operation of a buffer (daisy bus 25, see column 4 line 61 – column 5 line 35) coupled within and controlled by the selector, so that the buffer permits transmission of output from such transducer to the output processing subsystem if such transducer is selected.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 12, 14, 17, 28, 30, 33-35, 40, 42, 45, 46, 48 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Harrison, Jr. et al.** in view of **Talish et al. (US 2004/0064051 A1)**.

Harrison, Jr. et al. discloses a transducer-based sensor system (see Figures) comprising: a transducer array (10) including a plurality of transducers (see Figure 1) and a selector (element selecting multiplex network 12) coupled with the transducer array (10) and configured to selectively activate within the transducer array by applying an enabling signal (see column 3 lines 29-63) to the transducer array for at least one, but less than all, of the transducers, such that the transducer array includes at least one selected transducer and at least one unselected transducer, where: for a selected transducer, application of the enabling signal enables a transmission path (see Figure 2) between the selected transducer and the output processing subsystem, thereby permitting output signals to be transmitted from the selected transducer to the output processing subsystem; and the transducer array being configured to isolate any unselected transducers (see Figures 2 and 4) from the output processing subsystem, where such isolation is obtained by disabling the transmission paths, thereby substantially preventing output signals from being transmitted from the unselected transducers to the output processing subsystem (see column 3 lines 29–62 and column 4 line 61 – column 5 line 35).

With regards to claim 1, **Harrison, Jr. et al.** discloses the claimed invention with the exception of at least one transducer in the transducer array being configured to attach to a sample material. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **Harrison, Jr. et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed however temporarily in the desired location.

With regards to claim 2, **Harrison, Jr. et al.** discloses for each transducer, the transmission path between such transducer and the output processing subsystem (see Figure 1) is selectively enabled and disabled via operation of a buffer (daisy bus 25, see column 4 line 61 – column 5 line 35) coupled within and controlled by the selector, so that the buffer permits

transmission of output from such transducer to the output processing subsystem if such transducer is selected.

With regards to claim 3, **Harrison, Jr. et al.** discloses a switch (see Figure 2) coupled within the transmission path between the transducer and the output processing system, and where the switch is controlled by the selector (25) so as to close if the transducer is selected, thereby enabling the transmission path between the transducer and the output processing subsystem (see Figures 2-4).

With regards to claim 12, **Harrison, Jr. et al.** clearly discloses the transducers as being piezoelectric crystals (see column 3 lines 29-31).

With regards to claim 14, **Harrison, Jr. et al.** discloses the transducers as being piezoelectric crystals (see column 3 lines 29-31) which are a form of "bulk acoustic wave devices" as the definition of a "bulk acoustic wave" is a wave which traverses within the test material and is not limited to the surface of the material.

With regards to claim 17, **Harrison, Jr. et al.** discloses a transducer based sensor system comprising a transducer array (10) including a plurality of transducers configured to be placed in operative proximity with a sample material (material under test), and configured to produce electrical output based upon a drive signal applied to the transducers and upon the sample material (definition of a transducer); an output transmission path (see Figures 1-2) associated with each transducer, each output transmission path being defined between its associated transducer and an output processing subsystem (see Figures 1-2) configured to receive electrical output from the transducers; and a selector (25) configured to control activation and deactivation of portions of the transducer array (see column 3 lines 29-62) by enabling and disabling the output transmission paths such that each output transmission path is either enabled, thereby allowing transmission of electrical output from the respective transducer to the output processing system, or disabled, thereby preventing transmission of electrical output from the respective transducer to the output processing system.

With regards to claim 17, **Harrison, Jr. et al.** discloses the claimed invention with the exception of at least one transducer in the transducer array being configured to attach to a sample material. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **Harrison, Jr. et al.** to attach at least one transducer in the transducer array to a sample material or test

object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed however temporarily in the desired location.

With regards to claim 28, **Harrison, Jr. et al.** clearly discloses the transducers as being piezoelectric crystals (see column 3 lines 29-31).

With regards to claim 30, **Harrison, Jr. et al.** discloses the transducers as being piezoelectric crystals (see column 3 lines 29-31) which are a form of "bulk acoustic wave devices" as the definition of a "bulk acoustic wave" is a wave which traverses within the test material and is not limited to the surface of the material.

With regards to claim 33, **Harrison, Jr. et al.** discloses a transducer based sensor system (see Figures) comprising: a transducer array including a plurality of transducers (10) and means for producing electrical output based upon drive signals applied to the transducers (see Figure 1 and column 2 lines 5 – 63); output processing means for receiving and processing electrical output from the transducer array (see Figures 1 and 6, video display terminal 38 is the final output device); an output transmission path (see Figures 1 and 2) associated with each of the plurality of transducers, each output transmission path means being defined between its associated transducer and the output processing means (see Figure 2); and selector means (25) for selectively activating and deactivating portions of the transducer array by enabling and disabling the output transmission path means (see Figures 1 and 2) such that each output transmission path means is either enabled, thereby allowing transmission of electrical output from the respective transducer (in array 10) to the output processing means, or disabled, thereby preventing transmission of electrical output from the respective transducer to the output processing means (see Figures 1-3).

With regards to claim 33, **Harrison, Jr. et al.** discloses the claimed invention with the exception of at least one transducer in the transducer array being configured to attach to a sample material. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **Harrison, Jr. et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such

that the location of the transducer head can be fixed however temporarily in the desired location.

With regards to claim 34, **Harrison, Jr. et al.** discloses a method of performing sensing operations on sample using a transducer array (10) having a plurality of transducers (see Figure 1), the method comprising: operating the transducer array sequentially through a plurality of different states (operation of transducer array to transmit and receive reflections from the test object), where the method includes for each state: activating one or more of the transducers (see Figure 2 and column 3 lines 29-62) within the transducer array (10), which includes applying a drive signal to the transducer (see Figure 2) and receiving a corresponding output signal for the transducer at an output processing subsystem (see Figure 1); and isolating all non-activated transducers within the transducer array to inhibit coupling of noise contributions from the non-activated transducers to the output processing subsystem (see Figures 1-4, column 3 lines 29-62, and column 4 line 61 – column 6 line 26), where the transducers which are activated are varied from state to state as the transducer array is operated through a plurality of different states (operation of transducer array to perform scanning function), thereby permitting output to be obtained for different portions of the transducer array at different times.

With regards to claim 34, **Harrison, Jr. et al.** discloses the claimed invention with the exception of attaching the sample to at least one transducer in the transducer array. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **Harrison, Jr. et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed, however temporarily, in the desired location.

With regards to claim 35, **Harrison, Jr. et al.** discloses activating one or more of the transducers within the transducer array by enabling an output transmission path between the transducer and the output processing subsystem (see RCV switches in Figure 2).

With regards to claim 40, **Harrison, Jr. et al.** discloses isolating all non-activated transducers within the transducer array by disabling the output transmission path between the transducer and the output processing subsystem (see RCV switches in Figure 2).

With regards to claims 42 and 45, **Harrison, Jr. et al.** discloses isolating all non-activated transducers within the transducer array by preventing drive signals from being applied to the transducer (see XMIT switches in Figure 2).

With regards to claim 46, **Harrison, Jr. et al.** discloses preventing drive signals from being applied to a non-activated transducer includes opening a switch between the non-activated transducer and a drive signal source (inherent in XMIT switches in Figure 2).

With regards to claim 48, **Harrison, Jr. et al.** discloses a method of employing an array of transducers (10) to perform a sensing operation on a sample material (test object), where the transducers are operatively coupled with an output processing subsystem (see Figure 1) configured to receive electrical output produced by the transducers (see Figure 1), the method comprising: generating a selection signal (network 12) which is to be applied to the transducer array in order to select a desired one of the transducers (see column 3 lines 29-62) and thereby obtain output from the desired one of the transducers; applying the selection signal to the transducer array (see Figures 1-4); selectively enabling, based on application of the selection signal, a transmission path operatively coupling the desired one of the transducers with the output processing subsystem (see RCV switches in Figure 2); and isolating the transducers within the transducer array, except for the desired one of the transducers, where such isolation is obtained by disabling transmission paths coupling such other transducers and the output processing subsystem, thereby substantially preventing output signals from being transmitted from such other transducers to the output processing subsystem (performed by RCV switches in Figure 2).

With regards to claim 48, **Harrison, Jr. et al.** discloses the claimed invention with the exception of attaching the sample to at least one transducer in the transducer array. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **Harrison, Jr. et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed, however temporarily, in the desired location.

7. Claims 1, 3, 8, 10, 12, 14, 17, 23, 25, 28, 30, 33-36, 40, 42, 45, 47, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over **linuma et al. (US 4,253,338)** in view of **Talish et al.**

linuma et al. discloses a transducer-based sensor system (see Figures) comprising: a transducer array including a plurality of transducers (see Figure 1 and column 2 lines 23-31) and a selector (15) coupled with the transducer array (see Figure 1) and configured to selectively activate within the transducer array by applying an enabling signal (see Figure 3 and column 2 line 49 – column 4 line 55) to the transducer array for at least one, but less than all, of the transducers, such that the transducer array includes at least one selected transducer and at least one unselected transducer, where: for a selected transducer, application of the enabling signal enables a transmission path (see switches Figure 1) between the selected transducer and the output processing subsystem (18, 19, 20, 21), thereby permitting output signals to be transmitted from the selected transducer to the output processing subsystem (18, 19, 20, 21); and the transducer array being configured to isolate any unselected transducers (see Figure 1 and column 2 line 49 – column 4 line 55) from the output processing subsystem, where such isolation is obtained by disabling the transmission paths (performed by opening the Switches in the receiving path ways), thereby substantially preventing output signals from being transmitted from the unselected transducers to the output processing subsystem (see column 2 line 49 – column 4 line 55).

With regards to claim 1, **linuma et al.** discloses the claimed invention with the exception of at least one transducer in the transducer array being configured to attach to a sample material. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **linuma et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed however temporarily in the desired location.

With regards to claim 3, **linuma et al.** discloses a switch (see Figure 1) coupled within the transmission path between the transducer and the output processing system, and where the switch is controlled by the selector (15, see column 2 line 49 – column 4 line 55) so as to close if

the transducer is selected, thereby enabling the transmission path between the transducer and the output processing subsystem (see Figures 1 and 5).

With regards to claims 8 and 10, **linuma et al.** clearly discloses a local drive signal generator (see Figures 1 and 5) for each transducer, where the selector (15) is configured to control transducer activation for each transducer by permitting drive signals to be applied from the local drive signal generator to the transducer if the transducer is selected (performed by the NAND gate, or AND gate if preferred, shown in Figure 1 which activates the local drive when the transducer is selected), by preventing drive signals being applied from the local drive signal generator to the transducer if the transducer is unselected (local drive signal generator only activated by the selection of the associated transducer, see column 2 lines 49-68).

With regards to claim 12, **linuma et al.** clearly discloses the transducers as being piezoelectric crystals (see column 2 lines 25-29).

With regards to claim 14, **linuma et al.** discloses the transducers as being piezoelectric crystals (see column 2 lines 25-29), which are a form of "bulk acoustic wave devices" as the definition of a "bulk acoustic wave" is a wave, which traverses within the test material and is not limited to the surface of the material.

With regards to claim 17, **linuma et al.** discloses a transducer based sensor system comprising a transducer array including a plurality of transducers (see Figures 1 and 4 and column 2 line 23 – column 4 line 55) configured to be placed in operative proximity with a sample material (human body), and configured to produce electrical output based upon a drive signal applied to the transducers and upon the sample material (definition of a transducer); an output transmission path (see Figure 1) associated with each transducer, each output transmission path being defined between its associated transducer and an output processing subsystem (see 18, 19, 20, 21 in Figure 1) configured to receive electrical output from the transducers; and a selector (15) configured to control activation and deactivation of portions of the transducer array (see column 2 lines 49 – column 4 line 55) by enabling and disabling the output transmission paths such that each output transmission path is either enabled, thereby allowing transmission of electrical output from the respective transducer to the output processing system, or disabled, thereby preventing transmission of electrical output from the respective transducer to the output processing system (performed by switches in output transmission path in Figures 1 and 5).

With regards to claim 17, **Iinuma et al.** discloses the claimed invention with the exception of at least one transducer in the transducer array being configured to attach to a sample material. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **Iinuma et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed however temporarily in the desired location.

With regards to claims 23 and 25, **Iinuma et al.** clearly discloses a local drive signal generator (see Figures 1 and 5) for each transducer, where the selector (15) is configured to control transducer activation for each transducer by permitting drive signals to be applied from the local drive signal generator to the transducer if the transducer is selected (performed by the NAND gate, or AND gate if preferred, shown in Figure 1 which activates the local drive when the transducer is selected), by preventing drive signals being applied from the local drive signal generator to the transducer if the transducer is unselected (local drive signal generator only activated by the selection of the associated transducer, see column 2 lines 49-68).

With regards to claim 28, **Iinuma et al.** clearly discloses the transducers as being piezoelectric crystals (see column 2 lines 25-29).

With regards to claim 30, **Iinuma et al.** discloses the transducers as being piezoelectric crystals (see column 3 lines 25-29), which are a form of "bulk acoustic wave devices" as the definition of a "bulk acoustic wave" is a wave, which traverses within the test material and is not limited to the surface of the material.

With regards to claim 33, **Iinuma et al.** discloses a transducer based sensor system (see Figures) comprising: a transducer array including a plurality of transducers (see Figure 1 and column 2 lines 23-29) and means for producing electrical output based upon drive signals applied to the transducers; output processing means (18, 19, 20, 21) for receiving and processing electrical output from the transducer array (see Figure 1); an output transmission path (see Figures 1 and 5) associated with each of the plurality of transducers, each output transmission path means being defined between its associated transducer and the output processing means (see Figure 1); and selector means (15) for selectively activating and deactivating portions of the transducer array by enabling and disabling the output transmission

path means (see Figure 1) such that each output transmission path means is either enabled, thereby allowing transmission of electrical output from the respective transducer to the output processing means (18, 19,20,21), or disabled, thereby preventing transmission of electrical output from the respective transducer to the output processing means (see Figures 1 and 5).

With regards to claim 33, **linuma et al.** discloses the claimed invention with the exception of at least one transducer in the transducer array being configured to attach to a sample material. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **linuma et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed however temporarily in the desired location.

With regards to claim 34, **linuma et al.** discloses a method of performing sensing operations on sample (human body) using a transducer array (see Figure 1) having a plurality of transducers (see Figure 1), the method comprising: operating the transducer array sequentially through a plurality of different states (operation of transducer array to transmit and receive reflections from the test object), where the method includes for each state: activating one or more of the transducers (see Figures and column 2 line 49 – column 4 line 55) within the transducer array, which includes applying a drive signal (from local pulse generator) to the transducer (see Figure 1) and receiving a corresponding output signal for the transducer at an output processing subsystem (18, 19, 20, 21 in Figure 1); and isolating all non-activated transducers within the transducer array to inhibit coupling of noise contributions from the non-activated transducers to the output processing subsystem (see Figure 1, column 2 line 23 to column 4 line 55, performed by switch in output transmission path), where the transducers which are activated are varied from state to state as the transducer array is operated through a plurality of different states (operation of transducer array to perform scanning function), thereby permitting output to be obtained for different portions of the transducer array at different times.

With regards to claim 34, **linuma et al.** discloses the claimed invention with the exception of attaching the sample to at least one transducer in the transducer array. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art

at the time the invention was made to modify the system of **Iinuma et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed, however temporarily, in the desired location.

With regards to claim 35, **Iinuma et al.** discloses activating one or more of the transducers within the transducer array by enabling an output transmission path between the transducer and the output processing subsystem (see switches in Figure 1).

With regards to claim 36, **Iinuma et al.** clearly discloses a local drive signal generator (see Figures 1 and 5) for each transducer, where activating one or more of the transducers includes enabling the local drive signal generator associated with the transducer to be activated (performed by the NAND gate, or AND gate if preferred, shown in Figure 1 which activates the local drive when the transducer is selected, see column 2 lines 49-68).

With regards to claim 40, **Iinuma et al.** discloses isolating all non-activated transducers within the transducer array by disabling the output transmission path between the transducer and the output processing subsystem (see switches in Figure 1).

With regards to claims 42 and 45, **Iinuma et al.** clearly discloses isolating all non-activated transducers by preventing drive signals from being applied to the transducer (local drive signal generator only activated by the selection of the associated transducer, see column 2 lines 49-68).

With regards to claim 47, **Iinuma et al.** clearly discloses preventing drive signals from being applied to a non-activated transducer by disabling a local drive signal generator (see Figures 1 and 5) associated with and configured to apply drive signals to the non-activated transducer (performed by the NAND gate, or AND gate if preferred, shown in Figure 1 which activates the local drive when the transducer is selected, this insures the local drive signal generator is only activated by the selection of the associated transducer, see column 2 lines 49-68).

With regards to claim 48, **Iinuma et al.** discloses a method of employing an array of transducers (see Figure 1) to perform a sensing operation on a sample material (human body), where the transducers are operatively coupled with an output processing subsystem (see 18, 19, 20, 21 in Figure 1) configured to receive electrical output produced by the transducers (see Figure 1), the method comprising: generating a selection signal (15) which is to be applied to

the transducer array in order to select a desired one of the transducers (see column 2 lines 23 – column 4 line 55) and thereby obtain output from the desired one of the transducers; applying the selection signal to the transducer array (see Figures 1 and 5); selectively enabling, based on application of the selection signal, a transmission path operatively coupling the desired one of the transducers with the output processing subsystem (see switches in Figure 1); and isolating the transducers within the transducer array, except for the desired one of the transducers, where such isolation is obtained by disabling transmission paths coupling such other transducers and the output processing subsystem, thereby substantially preventing output signals from being transmitted from such other transducers to the output processing subsystem (performed by switches in Figure 1).

With regards to claim 48, **linuma et al.** discloses the claimed invention with the exception of attaching the sample to at least one transducer in the transducer array. **Talish et al.** teaches attaching an ultrasonic transducer to an object using a mounting apparatus with adhesive on both sides. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of **linuma et al.** to attach at least one transducer in the transducer array to a sample material or test object as taught by **Talish et al.** as **Talish et al.** clearly indicates that the adhesive mounting is an alternative useable when no movement of the ultrasonic transducer head is desirable such that the location of the transducer head can be fixed, however temporarily, in the desired location.

8. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over **linuma et al.** in view of **Talish et al.** as applied to claim 23 above, and further in view of **Harrison, Jr. et al.**

linuma et al. in view of **Talish et al.** discloses the claimed invention with the exception of the output transmission path between each transducer and the output processing subsystem is selectively enabled and disabled via operation of a buffer coupled within the output transmission path.

Harrison, Jr. et al. teaches that the use of a "buffer" (daisy bus with multiplexer switches) is an acceptable alternative in ultrasonic imaging when utilizing activating multiple transducers within a transducer array in order to speed up the processing time and to simplify the number of connections between the transducer array and the output processing subsystem.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the transducer system of **linuma et al.** with a "buffer" coupled

within the transmission output path in order to speed up processing and to simplify and minimize the connections within the transducer system as taught by **Harrison, Jr. et al.**

9. Claims 4, 18, 26, 41, and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over **linuma et al.** in view of **Talish et al.** as applied to claims 1, 17, 25, 40, and 34 above, and further in view of **Robinson et al. (US 6,419,633 B1)**.

linuma et al. in view of **Talish et al.** discloses the claimed invention in claims 4, 18, 26, 41, and 43-44 with the exception of the transducer being operatively connected to a terminating impedance through the switching device in the output transmission pathway if the associated transducer is unselected.

Robinson et al. teaches at column 3 lines 26-31 that the unused transducer elements can be left electrically open, can be connected together, can be grounded, or can be conducted to ground potential by an impedance to control the electrical boundary conditions on the elements that are not in use.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of **linuma et al.** in view of **Talish et al.** with a terminating impedance for connecting to the unused or unselected transducers as taught by **Robinson et al.** as **Robinson et al.** clearly teaches that conducting the unused (unselected) transducers to ground potential through or by an impedance helps to control the electrical boundary conditions on the transducer elements which are not in use.

Allowable Subject Matter

10. Claims 13, 27, 31, 37-38, and 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 53-55 are allowed.

Response to Arguments

12. Applicant's arguments with respect to claims 1-4, 8, 10, 12, 14, 17-18, 23-26, 28, 30, 33-36, and 40-48 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wilk (US 6,306,090 B1) discloses an ultrasonic medical system and associated method.

Redding, Jr. (US 2002/0156414 A1) discloses an ultrasonically enhanced substance delivery method.

Smith (US 2003/0149359 A1) discloses an adhesive hydrophilic membranes as couplants in ultrasound imaging applications.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M. Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Friday, 7:30 am to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RMM
15 September 2005

HEZRON WILLIAMS
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